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Evaluating Mobile Applications for Urban Tourism

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ABSTRACT

With the spread of mobile communication, destinations have to decide whether, and in case how, to inform and drive their guests through smartphones.

Three groups of issues must be addressed.

- a. Mobile content and its usability differ from those designed for desktop.
- b. Smartphones use web pages as well as proprietary applications.
- c. Smartphones connect both through telecoms and hotspots, posing specific cost problems.

With a view to understanding how these issues have been addressed by urban destinations, a reasonably representative sample of forty-four European destinations was identified.

To compare the quality of the mobile applications available in the sample destinations, the 7Loci meta-model – already well established for destination websites – was used.

More discursively, some critical points were finally identified, and the mobile services available on-site were compared with those offered for the same cities by four global platforms: TripAdvisor, Foursquare, TripWolf and Google.

Keywords: Tourism, Destination, Mobile, App, Europe

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It has been observed that “mobile-broadband subscriptions have climbed from 268 million in 2007 to 2.1 billion in 2013. This reflects an average annual growth rate of 40%, making mobile broadband the most dynamic ICT market.”¹ This trend involves the world of tourism, too: by the summer of 2012, “travel website traffic via the mobile web has increased by a staggering 72% in the last six months, to account for a total of 17.4% of all website traffic in the industry.”²

As mobile communication grows, Destination Management Organizations (DMOs) face the question of whether – and in case how – to inform and drive their guests through smartphones.

1. The issues: content, protocols, and costs

Researchers have come to know from experience that urban DMOs which confront the mobile communication question must address the following three groups of issues.

- a. **Content.** Content to be delivered through smartphones – and its usability – differ from that designed for desktop webpages, which was often generated from old-style printed material.
- b. **Protocols.** Smartphones are designed to browse open-source webpages as well as to work proprietary apps, depending on the smartphones’ operating systems.
- c. **Costs.** As smartphones communicate through telecom networks and Wi-Fi hotspots, they present final users and information providers with cost and infrastructure problems which differ from those implied in desktop navigation.

As for point a. – Content – the conclusions of a pioneer research conducted six years ago are still relevant.³ The author of this research obtained from that research a diagram, the substance of which is available here (see Table 1).

In the last six years, however, ICTs have moved forward. For instance, no social apps were popular in 2007. Today mobile communication also allows “Personalization by market segments down to individual needs” (point 3 in the diagram), “Information comparison through comments’, photo and video communities” (point 4 in the diagram), “Purchase of products directly from Travel Producers, through OnLine Travel Agents, and through Travel Publishers” (point 5 in the diagram) and “Purchase of personal services: Tickets, Local guides, Excursions, Local courses” (point 6 in the diagram).

Moreover, the diagram in Table 1 should be complemented with two brand new points., related to a couple of recently popularized ICT services, i.e. Location-Based Services (LBS) – which add geographic information to personalization (point 3 in the diagram) – and gamification.

Coming to point b. – Protocols – some urban DMOs have chosen to make their websites adaptive or responsive, and deliver smartphone-enabled web apps. Other DMOs have produced their own proprietary apps. A few have adopted both solutions. Several others have done nothing.

Different choices certainly depend on different conditions and budgets. Still, they are the results of different communication policies, and reveal how much urban DMOs care

about mobile communication as far as promotion, heritage interpretation and customer retention are concerned.

As for point c. – Cost and infrastructure – another not-so-recent statement ought to be mentioned.⁴ This, too, was somehow prophetic. “When wide area wireless connectivity is a reality, tourism behaviour at destinations will change to take advantage [of] ubiquitous connectivity and instant access to information. Hence tourism organisations should develop appropriate infostructure and marketing strategies to take advantage”.

Table 1. Different needs of desktop vs. mobile tourists

Desktop users' needs: before the journey	
1. Information	On the destination On advisable tours on the spot On accommodation On flights On railways On local rental services On package tours
2. Experience prediction	Through pictures Through videos Through presentations Through virtual reality
3. Personalization	By market segments Down to individual needs
4. Information sharing	Comments' communities Photo communities Video communities
5. Purchase of products	Directly from Travel Producers Through OnLine Travel Agents Through Travel Publishers
6. Purchase of personal services	Tickets Local guides Excursions Local courses
Mobile users' needs: during the journey	
a. Tourist guide	“What can I do?” “Will that venue still be open?” “What is this building?”
b. Advice	“Where can I have a bite?” “Any toilets in the area?” “Anything attracting in the area?”
c. Geolocalization	“Where am I?”

	"Which directions to the central square?" "Which directions to my hotel?"
d. Local transport	"Which bus? And where shall I get off?" "Do they sell tickets on board?" "How late does that bus operate?"
e. Reassurance	"Is it going to rain?" "Any parking lots? Where? How expensive?" "Is this a dangerous area?"
f. Communication	"I have to place a call!" "I'd love to send a text message!" "I need to consult that webpage..."
Source: translated and adapted from http://dinamico1.unibg.it/turismo/material/Tecnologie_digitali_e_turisti_TCI_20071120.pdf , which was derived from Jörg Rasinger, Matthias Fuchs, Wolfram Höpken, "Information Search with Mobile Tourist Guides: A Survey of Usage Intention", in <i>Information Technology & Tourism</i> , Vol. 9, 3/4 (2007), pp. 177-194.	

2. A sample of European urban destinations

To understand how urban DMOS have confronted the issues above, a sample of European urban destinations was identified.⁵ The sample included destinations which

- are connected by low-cost flights, specifically by the leading European low-cost carrier,⁶
- have a vocation for cultural tourism, i.e. rely on heritage for their sustainability, and
- are not major destinations.

As for point a., a nearby airport served by Ryanair (Picture 1) was considered a prerequisite. Low-cost flights have provided the condition for urban short-breaks to become more common in Europe, perhaps the most typical sort of tourism at the beginning of the third millennium.⁷ Intentionally, the sample did not include any Ryanair seasonal airports that mainly serve extended-stay holidaymakers.

Archetypal leisure destinations such as Ibiza, Faro or Zakynthos, and pilgrimage towns such as Lourdes or Santiago, were not considered. Apparently, mobile communication is less important for those destination in terms of promotion, heritage interpretation and customer retention.

Leading destinations were also dismissed, as their brands attract tourism anyway, and do so more efficiently than any mobile communication systems. It may be observed that by October 2013 the DMO of Paris had provided neither web apps nor apps,⁸ and as early as 2011 Vienna has taken the definitive stance not to produce any apps.⁹ London itself released its own app quite recently – with no instant accomplishments, by the way.¹⁰



Picture 1. Ryanair European destinations, October 2013. Source: <http://www.ryanair.com/>
The sample of destinations identified for the purposes of this research is shown in Table 2.

Table 2. Ryanair European destinations, October 2013, and the sample identified for the purposes of this research

Country	Destination	Airport	RyanAir
an asterisk * marks the destinations identified as a sample for the purposes of this research			
Austria	Klagenfurt	Klagenfurt	
Austria	Linz	Linz	
Austria	* Salzburg	Salzburg	
Belgium	Bruxelles	Charleroi	base
Bulgaria	Plovdiv	Plovdiv	
Croatia	Rijeka	Rijeka	seasonal
Croatia	Osijek	Osijek	
Croatia	Pula	Pula	seasonal
Croatia	* Zadar	Zadar	
Cyprus	Paphos	Paphos	base

Czech Republic		Brno	Brno	
Czech Republic		Ostrava	Ostrava	
Denmark	*	Aarhus	Aarhus	
Denmark		Billund	Billund	base
Estonia		Tallinn	Tallinn	
Finland		Helsinki	Lappeenranta	
Finland		Tampere	Tampere	
France		Biarritz	Biarritz	
France	*	Bordeaux	Bordeaux	
France		Brest	Brest	
France		Beziers	Beziers	
France	*	Carcassonne	Carcassonne	
France		Clermont-Ferrand	Clermont Ferrand	
France		Dole	Dole	
France		Brive	Brive	seasonal
France		Bergerac	Bergerac	
France		Figari	Figari	seasonal
France		Grenoble	Grenoble	seasonal
France		La Rochelle	La Rochelle	
France	*	Lille	Lille	
France	*	Limoges	Limoges	
France		Lourdes	Tarbes	
France	*	Marseille	Marseille	
France		Montpellier	Montpellier	
France	*	Nantes	Nantes	
France	*	Nîmes	Nîmes	
France	*	Nice	Nice	seasonal
France		Paris	Beauvais	
France		Paris	Vatry	
France		Pau	Pau	
France	*	Perpignan	Perpignan	
France		Poitiers	Poitiers	
France		Rodez	Rodez	
France		Saint-Étienne	St Etienne	
France	*	Saint-Malo	Dinard	
France	*	Strasbourg	Strasbourg	
France		Toulon	Toulon	seasonal
France		Tours	Tours	
Germany	*	Hamburg	Hamburg-Lubeck	
Germany		Berlin	Schönefeld	
Germany	*	Bremen	Bremen	base
Germany	*	Cologne	Köln/Bonn	
Germany		Dortmund	Dortmund	
Germany		Düsseldorf	Weeze	
Germany	*	Frankfurt	Frankfurt-Hahn	base
Germany		Karlsruhe	Karlsruhe/Baden-Baden	base
Germany	*	Leipzig	Leipzig	

Germany		Magdeburg	Magdeburg	seasonal
Germany	*	Munich	Memmingen	
Germany		Münster	Münster	
Germany	*	Nuremberg	Nuremberg	
Greece		Kefalonia	Kefalonia	seasonal
Greece		Chania	Chania	base
Greece		Corfu	Corfu	seasonal
Greece		Kalamata	Kalamata	seasonal
Greece		Kos	Kos	seasonal
Greece		Patrass	Araxos	seasonal
Greece		Rhodes	Rhodes	seasonal
Greece	*	Thessaloniki	Thessaloniki	
Greece		Volos	Volos	seasonal
Greece		Zakynthos	Zakynthos	
Holland		Eindhoven	Eindhoven	base
Holland		Groningen	Eelde	
Holland		Maastricht	Maastricht/Aachen	base
Hungary		Budapest	Budapest	base
Ireland		Limerick	Shannon	base
Ireland	*	Cork	Cork	base
Ireland		Dublin	Dublin	base
Ireland		Kerry	Kerry	
Ireland		Knock	Ireland West	
Italy		Alghero	Alghero	base
Italy		Ancona	Ancona	
Italy	*	Bari	Bari	base
Italy	*	Bergamo	Orio al Serio	base
Italy	*	Bologna	Bologna	base
Italy	*	Brescia	Brescia	
Italy		Brindisi	Brindisi	base
Italy		Cagliari	Cagliari	base
Italy	*	Catania	Catania	
Italy		Comiso	Comiso	
Italy		Cuneo	Cuneo	
Italy	*	Genoa	Genoa	
Italy		Lamezia Terme	Lamezia	
Italy	*	Palermo	Palermo	
Italy	*	Parma	Parma	
Italy	*	Perugia	Perugia	
Italy		Pescara	Pescara	base
Italy	*	Pisa	Pisa	base
Italy		Rome	Ciampino	base
Italy	*	Turin	Turin	
Italy		Trapani	Trapani	base
Italy	*	Trieste	Trieste	
Italy		Venice	Treviso	
Italy	*	Verona	Verona	

Latvia	Riga	Riga	
Lithuania	Kaunas	Kaunas	base
Lithuania	Vilnius	Vilnius	
Malta	Malta	Malta	base
Montenegro	Podgorica	Podgorica	
Norway	Haugesund	Haugesund	
Norway	Oslo	Sandefjord, Torp	
Norway	Oslo	Moss, Rygge	base
Poland	Bydgoszcz	Bydgoszcz	
Poland	* Krakow	Krakow	base
Poland	* Gdansk	Gdansk	
Poland	Katowice	Katowice	
Poland	Łódź	Lodz	
Poland	Lublin	Lublin	
Poland	Poznań	Poznan	
Poland	Rzeszów	Rzeszow	
Poland	Stettino	Szczecin	
Poland	Warsaw	Chopin	
Poland	Warsaw	Modlin Mazovia	
Poland	Wroclaw	Wrocław	base
Portugal	Faro	Faro	base
Portugal	Lisbon	Lisbon	
Portugal	* Porto	Porto	base
Romania	Constanta	Constanta	seasonal
Romania	Târgu Mures	Targu Mures	
Slovakia	Bratislava	Bratislava	
Spain	Alicante	Alicante	base
Spain	Almería	Almeria	seasonal
Spain	Barcelona	El Prat	base
Spain	Barcelona	Tarragona/Reus	
Spain	Barcelona	Girona	base
Spain	Fuerteventura	Fuerteventura	
Spain	Gran Canaria	Gran Canaria	
Spain	Ibiza	Ibiza	
Spain	Jerez de la Frontera	Jerez	
Spain	Lanzarote	Lanzarote	
Spain	Madrid	Barajas	base
Spain	Malaga	Malaga	base
Spain	Minorca	Menorca	
Spain	Murcia	Murcia	
Spain	Palma	Palma	base
Spain	Santander	Santander	
Spain	Santiago	Santiago	
Spain	* Zaragoza	Zaragoza	
Spain	* Seville	Seville	base
Spain	Tenerife	Reina Sofía	
Spain	Tenerife	Los Rodeos	

Spain	*	Valencia	Valencia	base
Spain		Valladolid	Valladolid	
Sweden		Angelholm	Angelholm	
Sweden		Gothenburg	City	
Sweden		Jönköping	Jonkoping	
Sweden		Kalmar	Kalmar	
Sweden		Karlstad	Karlstad	seasonal
Sweden	*	Malmö	Malmö	
Sweden		Skellefteå	Skelleftea	seasonal
Sweden		Stockolm	Skavsta	base
Sweden		Stockolm	Västerås	
Sweden		Växjö	Växjö	
UK		Birmingham	Birmingham	base
UK		Bournemouth	Bournemouth	base
UK		Bristol	Bristol	base
UK		Derry	Derry	
UK		Doncaster/Sheffield	Doncaster	seasonal
UK		East Midlands	East Midlands	base
UK		Edinburgh	Edinburgh	base
UK	*	Glasgow	Prestwick	base
UK		Leeds	Leeds/Bradford	base
UK		Liverpool	Liverpool	base
UK		London	Gatwick	
UK		London	Luton	base
UK		London	Stansted	base
UK		Manchester	Manchester	base
UK		Newcastle upon Tyne	Newcastle	

Source: Authors' elaboration from <http://www.ryanair.com/> and <http://en.wikipedia.org/>

Admittedly, the choice of these European destinations was not based on quantitative data, nor could any “vocation for cultural tourism” – a matter of heritage and brand management – be easily quantified. Yet, the research needed to identify a reasonable and workable subset of European urban destinations, where informing and driving guests through smartphones are, or could soon become, a crucial factor for the purposes of promotion, heritage interpretation and customer retention.

3. Mobile applications for urban tourism. Where and which

A study on which mobile applications were available, if any, for the sample of forty-four European urban destinations, was conducted via Web and App Store in October 2013. The result is shown in Table 3.

The web search engine used was the global edition of Google <http://google.com/>

In order to produce more reliable outcomes, the destinations' names were searched in the local language as well as in English, and both the web and the App Store searches were interrupted only when no relevant results any longer appeared.

It is worth mentioning that the web and App Store searches were meant to select applications that

- a. were actually usable on smartphones,¹¹
- b. included tourism content, i.e. somehow interpreted the destination,
- c. were not intended for dwellers,¹²
- d. were produced locally, i.e. did not belong to any publisher's series,
- e. were professional in tourism terms.

In other words, the web and App Store searches excluded those applications that mainly targeted the locals or, on the opposite side of the spectrum, were not conceived with the destination's interest at heart.

The latter include serial products edited with no continual connection with the destination's everyday life (but, rather, published as the result of outside marketing policies)¹³ as well as local applications clearly intended to show off personal or entrepreneurial ICT skills, with no professional ability to assist the destination's guests.¹⁴

For each destination (first and second column) from the identified sample, Table 3 shows

- whether an official DMO web app was available and readable on a smartphone automatically or through a single click (third column: Official Destination Web App),
- whether unofficial tourism information apps were available, and produced by local businesses in continual connection with the destination's everyday life (fourth column: Local Unofficial Apps), and
- whether an app was available (fifth column: Official Destination App) that was produced or officially adopted by a local DMO.¹⁵

In other words, Table 3 provides a substantial source on which applications the destinations of the identified sample offered to mobile tourists in October 2013.

Among the forty-four destinations of the sample, Table 3 shows only the twenty-seven ones that offered any mobile applications in October 2013.

Whether an official web app was readable on a smartphone, automatically or through a single click (third column: Official Destination Web App), was tested using an iPhone 4 and a Nokia 720, also checking via browser on a desktop computer if an adaptive or a responsive approach was adopted.¹⁶

Table 3. Mobile applications for urban tourism in the sample destinations, October 2013

Destination	Country	Official Destination Web App	Local Unofficial Apps	Official Destination App
Aarhus	Denmark	x	x	
Bergamo	Italy	x		
Carcassonne	France			x
Cologne	Germany	x		
Cork	Ireland		x	
Frankfurt	Germany		x	
Genoa	Italy	x	x	
Glasgow	UK			x
Hamburg	Germany	x		x
Krakow	Poland	x		x
Lille	France			x
Malmö	Sweden	x		
Munich	Germany			x
Nantes	France	x		
Nîmes	France			x
Perpignan	France	x		
Perugia	Italy			x
Pisa	Italy	x		
Porto	Portugal		x x	
Saint-Malo	France			x
Salzburg	Austria	x		
Seville	Spain	x		x
Trieste	Italy		x x	
Turin	Italy			x
Valencia	Spain	x		x
Verona	Italy		x	
Zadar	Croatia	x		x

Source: Authors' elaboration from the official websites of the selected destinations and App Store, October 2013

4. The 7Loci meta-model to evaluate destination mobile applications

To provide a quality evaluation of the existing web apps and apps, the 7Loci meta-model¹⁷ was used. The 7Loci is frequently adopted to evaluate the quality of destination websites.¹⁸ For the purposes of this research, in order to take the issues

summarized above in due consideration, the evaluation scheme of the meta-model had to be at least partially adapted¹⁹ to the mobile field.

Tourism actors to consider

The 7Loci adopts the ISO Definition of Quality²⁰ and assumes the needs – stated or implied – of all the actors involved are considered.

From literature²¹ and experience, researchers have long known the categories of actors involved in the process of designing and running a digital system meant to serve a destination, or Destination Management System (DMS). In short, these categories can be summarized as follows:

1. regional tourists from different market segments, more likely to be frequent guests;
2. domestic tourists from different market segments, less likely to be frequent guests;
3. foreign tourists from different countries and from different market segments;
4. local authorities;
5. content producers and content maintainers (text, pictures, sound, video);
6. communication managers and communication maintainers;
7. technical managers and technical maintainers;
8. local producers of tourism services (accommodation, food, shops etc.);
9. local cultural institutions, both public and private.

Suggestions on tourists' market segments to consider

As for the needs of tourists (categories 1 to 3), Table 1 and its suggested update²² can, generally speaking, be considered; obviously, distinctions apply according to countries and cultures. Market segments can be basically identified from the navigation layout adopted by benchmark global platforms for mobile tourism (Picture 2). A short list follows.

- Short Breakers
- In the Know
- Nonconformist
- Budget Conscious
- With Kids.

A more accurate segmentation is certainly welcome according to the destination's policies, especially if gender issues or age groups are considered.

Local tourism actors' needs to consider

As for the needs of local authorities, managers, maintainers and tourism actors (categories 4 to 9), some general recommendations are listed here.

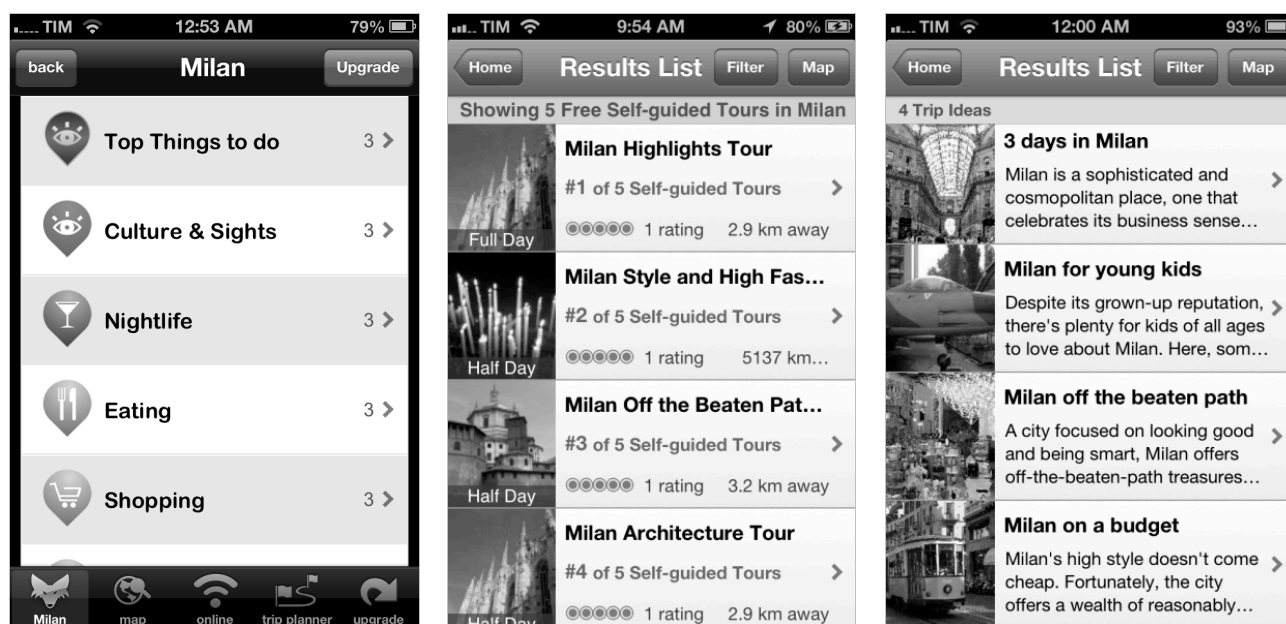
Local authorities need to check – early on as well as over time – to what degree the quality of content, its maintenance and the provided services correspond to the

resources they have made available for the tasks undertaken. They also need to check whether the policies they have adopted fulfil those tasks, and be in a position to optimize or correct those policies from time to time.

Content producers and content maintainers need to be granted – early on as well as over time – resources, technologies, connectivity and permissions sufficient to allow them to produce, maintain and update the needed data day by day, and restructure them when this is the case.

Communication managers and communication maintainers need to be granted – early on as well as over time – resources, technologies, connectivity and permissions sufficient to allow them to perform traffic analysis, as well as competences to draw conclusions from the analysis, refer to content producers and content maintainers day by day, and to local authorities from time to time.

Technical managers and technical maintainers need to be granted – early on as well as over time – resources sufficient to allow them to provide technologies, connectivity and permissions corresponding to the tasks undertaken, and be in a position to optimize and update technologies, connectivity and permissions when necessary. If more than one managing agency is involved, the involved agencies must cooperate fully in the system's frame.



Picture 2. Screenshots showing navigation by themes and by market segments in benchmark global platforms for mobile tourism. Sources: TripWolf and TripAdvisor on iPhone 4

Local producers of tourism services (accommodation, food, shops etc.) need to be in a position – early on as well as over time – to see the quality of their work and premises duly represented in the destination's digital system, and take active part in the system's e-commerce functions, if any. These needs can be satisfied by allowing local producers of tourism services a direct and individual access to the system's back office. Local cultural institutions, both public and private, also need to be in a position to see the quality of their work and premises duly represented, take active part in the

system's e-commerce functions, if any, and in case be allowed to access directly and individually the system's back office.

5. A proposed quality evaluation questionnaire

The seven fundamental questions on which the 7Loci meta-model is based – *quis? quid? cvr? vbi? quando? quomodo? quibus auxiliis?* – must be developed according to the actors' needs, in order to produce specific evaluation models. Suitable questionnaires can therefore be proposed.

So does this research, and a questionnaire has been proposed (Table 4) that can be used either to find out strengths and weaknesses of an existing application, or to compare different applications of the same sort. The latter is our case.

This research cannot take into consideration the resources (*quibus auxiliis?*) available to each DMO or private business from the identified sample. Of the seven fundamental questions proposed by the 7Loci meta-model, only the first six were discussed.

Table 4. Proposed quality evaluation questionnaire for mobile applications in urban tourism

Identity :: Quis? :: Who	
Brand	Does the application communicate an identity?
Destination Image	Does the application identify what sort of tourism can be performed in the destination?
Graphic Design	Does the application have a suitable graphic layout?
Personalization	Does the application provide different content for different tourists' market segments?
Gamification	Does the application provide some sorts of interactive game?
Content :: Quid? :: What	
Managers Content Compliance	Does the content provided by the application meet the managers' needs?
Info on Managers	Does the application inform on its managers, and where they can be contacted on the spot?
Users Content Compliance	Does the content provided by the application meet the users' needs?
Info Content	Is the text content provided by the application sufficient and reasonably exhaustive?
Media Content	Is the media content provided by the application sufficient?
Links	Does the application allow going and visiting other applications of the same sort?
Events	Does the application inform on locally scheduled events?
Sources Copyrights	Does the application comply with international copyright standards?
Services :: Cur? :: Why	
Managers Services Compliance	Do the services provided by the application meet the managers' needs?
Users Services Compliance	Do the services provided by the application meet the users' needs?
Meteo	Does the application provide, or effectively link to, relevant meteo information services?
Transport	Does the application provide, or effectively link to, detailed information on local transport?
Parking	Does the application provide, or effectively link to, detailed information on local parking lots?
Reassurance	Does the application provide, or link to, information on how safe local districts are?
ECommerce	Does the application provide e-commerce functions?
Ecommerce Services	Do the application's e-commerce functions work effectively?
Security & Privacy	Does the application comply with security and privacy standards?
Cartography	Does the application provide, or effectively link to, geo-localized maps?
LBS	Does the application provide location-based services?
Individuation :: Ubi? :: Where	
Positioning	Is the application easily found on line and in case downloadable?

Basic Communication	Does the application allow communication between its managers and its users?
Offline Communication	Does the application suggest how to retrieve more tourist information in person?
Communication among Users	Does the application allow social communication among its final users?
Communication among Actors	Does the application allow communication among local professional tourism actors?
Management :: Quando? :: When	
Managers Management	Do the application's back office functions meet the managers' and the maintainers' needs?
Code Compliance	Does the application's code work properly?
Update	Is the content provided by the application frequently updated?
Links Compliance	Do links to other applications effectively work?
Technologies	Is the application technologically updated?
Usability :: Quomodo? :: How	
Operating Systems	Is the application designed or released to work under more than one operating system?
Download Time	Is the download time of the application reasonable?
Offline	Does the application provide reasonably useful information when the device is not wired?
Menu	Does the application always provide a usable navigation menu?
Cultures	Is the application designed to provide cultural editions other than in the local language?
Cultures Compliance	Does the application effectively provide cultural editions other than in the local language?
Language & Icons	Can users easily read and interpret the language and the icons used in the application?
Hardware & Software	Does the application fully work with no need of downloading further software?

6. A comparative evaluation

The proposed questionnaire was used to compare the quality of the mobile applications for urban tourism available in the sample of forty-four European destinations. The Boolean results are shown in Table 5.

How some questions were answered, and why

Some of the proposed questions can properly be answered only if the application's managers are interviewed.²³ In our case, answers to these questions have been conjectural, and cautiously optimistic. Intentionally, the question that refers to the Managers Management Compliance ("Do the application's back office functions meet the managers' and the maintainers' needs?") was not considered at all, as no answers can be provided if the managers are not interviewed.

The answer was "False" every time that a specific promise of information (for instance on personalization, public transport, parking, or hotel reservation) took the user to general descriptions only, leaving her/his need for information unsatisfied.

While evaluating web apps, the answer was "False" when

- the user – continuing her/his search for promised information or services – was unexpectedly led to webpages that didn't fit the small monitors of smartphones, and were practically unreadable;
- the user in search of an accommodation²⁴ was redirected to individual hotels' websites, even if hotels' websites were adaptive or responsive.

While evaluating apps, the answer was “True” when

- the user in search of an accommodation²⁵ found sufficient and relevant data on individual hotels, and was provided with phone numbers to call.

The download time for web apps was tested via <http://tools.pingdom.com/>, the threshold between “True” and “False” having been set to 5 seconds.

Rough conclusions from the performed evaluations

This research is not meant to analyze the performed evaluations. A task like this should be undertaken separately, and possibly several times in the future, adopting a comparable questionnaire on a comparable sample of European urban destinations. Nonetheless, some rough conclusions can be reached now.

- The number of urban DMOS that have produced proprietary apps is about the same of those that have delivered web apps; Hamburg, Krakow, Seville, Valencia and Zadar (more than one tenth of the sample) have implemented both solutions.
- Quality is not homogeneous, and mostly lower vs. benchmark global platforms for the same destination;²⁶
- in Italy, unofficial apps are more numerous, and often better, than official ones.

Table 5. The proposed quality evaluation questionnaire applied to the sample destinations: Boolean results

destination	application sort	application	Brand	Destination Image	Graphic Design	Personalization	Gamification	Managers Content Compliance	Info on Managers	Users Content Compliance	Info Content	Media Content	Links	Events	Sources Copyrights	Managers Services Compliance	Users Services Compliance	Meteo	Transport	Parking	Reassurance	ECommerce	Ecommerce Services Compliance	Security & Privacy	Cartography	LBS	Positioning	Basic Communication	Offline Communication	Communication among Users	Communication among Actors	Managers Management	Code Compliance	Update	Links Compliance	Technologies	Operating Systems	Download Time	Offline	Menu	Cultures	Cultures Compliance	Language & Icons	Hardware & Software Compliance				
Aarhus	w	visitaarhus.com	x	x	x	x		x	x	x	x	x	x	x					x			x	x	x	x			x	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x			
	a	Visit Aarhus	x		x	x					x	x	x					x	x						x									x	x	x	x	x	x	x	x	x	x	x	x			
Bergamo	w	bergamo.it				x								x													x	x		x							x											
Carcassonne	d	Carcassonne Tour	x	x	x	x	x	x		x	x		x	x		x	x	x					x	x	x		x	x	x		x			x	x	x	x	x	x				x	x	x			
Cologne	w	cologne.de	x	x	x	x		x	x	x	x		x	x		x						x	x	x			x	x	x	x				x	x	x	x	x	x		x	x	x	x	x	x		
Cork	a	Cork Top Ten						x					x												x			x											x	x					x	x		
Frankfurt	a	Newcomers Guide Frankfurt	x	x	x	x		x	x	x	x	x	x												x									x		x	x	x	x	x	x	x	x	x	x	x	x	
Genoa	a	Genova Official Guide		x	x	x		x						x					x						x			x	x	x												x			x			
	w	visitgenoa.it				x		x	x	x	x		x			x									x		x	x	x	x	x			x		x		x	x	x	x	x	x	x	x	x		
Glasgow	d	Glasgow Scotland with Style	x	x	x			x		x	x	x	x	x	x				x	x				x	x	x	x	x	x					x		x		x	x	x	x	x	x	x	x	x	x	
Hamburg	w	hamburg.de	x	x	x						x	x	x	x				x	x						x		x	x		x					x			x	x							x		
	d	hamburg.de	x		x	x		x	x		x			x	x					x		x	x		x	x	x	x	x							x	x									x	x	
Krakow	d	myKRRK	x	x	x			x		x	x		x	x					x	x					x		x	x	x					x	x	x	x	x	x	x	x	x	x	x	x	x	x	
	w	krakow.pl	x	x	x	x					x														x		x	x		x					x		x	x	x	x	x	x	x	x	x	x	x	
Lille	d	Lille	x	x		x		x	x	x	x	x	x	x											x			x	x						x	x	x	x	x	x	x	x	x	x	x	x	x	x
Malmö	w	malmotown.com	x	x	x	x		x	x	x	x	x		x	x										x		x	x	x	x	x				x	x		x	x	x	x	x	x	x	x	x	x	
Munich	d	muenchen.de	x		x	x		x	x	x	x		x	x					x			x	x		x	x	x	x							x	x	x	x	x					x		x	x	
Nantes	w	m.nantes-tourisme.com											x	x											x		x	x		x					x												x	
Nîmes	d	Nîmes	x		x			x	x	x	x			x											x		x	x	x						x	x		x	x	x	x	x	x	x	x	x	x	x
Perpignan	w	perpignantourisme.com						x		x	x		x					x		x								x	x						x	x		x	x									

[illegible]

w = official destination web app; a = local unofficial app; d = official destination app

6. Fuzzy comments

Finally, the author takes the liberty to add some personal – and perhaps fuzzy – comments, the consideration of which may hopefully be of help when optimizing mobile applications that have been already delivered, or are currently being designed. These comments come both from the evaluations performed while preparing this research, and from the author’s professional experience in the field.

1. **Basic usability.** Destinations' web content should be available on smartphones in full, though certainly packaged in a different way, and possibly with no need of any interventions by the users.
2. **Destination identity.** Smartphones are no longer intended as surrogate desktops, nor are switched on only to retrieve urgent information on-site. Hence, the destination's brand should be communicated on smartphones with no less strength than on desktops.
3. **Personalization by market segments.** Suggestions of activities and events according to the market segments should be available on smartphones, too, as tourists belong to different segments and their on-site decision-making is an on-going process.
4. **Gamification.** Because of the engagement it triggers, and the interaction between tourists and the environment it may facilitate, gamification is an option worth serious consideration.
5. **Destination managers' identity.** Beyond the identity of the destination, users should be made aware of the identity and on-site availability of the DMO as such: where and how to keep in touch with the DMO staff if anything is needed (see also point 9 hereunder).
6. **Priority needs.** Transport, parking and meteo information may be crucial for outdoor users. Smartphone usability for these sorts of information – not only the relevant content – should be specifically cared for.
7. **Accommodation.** List of hotels do not cater to the users' needs.

8. **LBS.** Smartphones are the quintessential devices for Location-Based Services. Thanks to LBS, interaction among tourists, the environment and the destination actors can increase dramatically.
9. **Direct communication.** Beyond social networking, which has become the default channel between tourists and the DMOS, it shouldn't be forgotten that tourist information offices still exist, and that phones were originally meant for calling in person.
10. **Costs.** Since telecom fares may be a problem – especially abroad – the destinations where free wireless connection is not satisfactorily available should consider delivering offline apps, the content of which may fulfil at least some basic information needs at no cost for the users.
11. **Navigation.** Traditional destination websites have grown to become complicated systems that are demanded to satisfy a variety of needs from events promotion to heritage interpretation, from mapping to e-commerce. While transferring all these functions to much smaller monitors, even an apparently simple question as the main navigation menu may prove hard to solve.

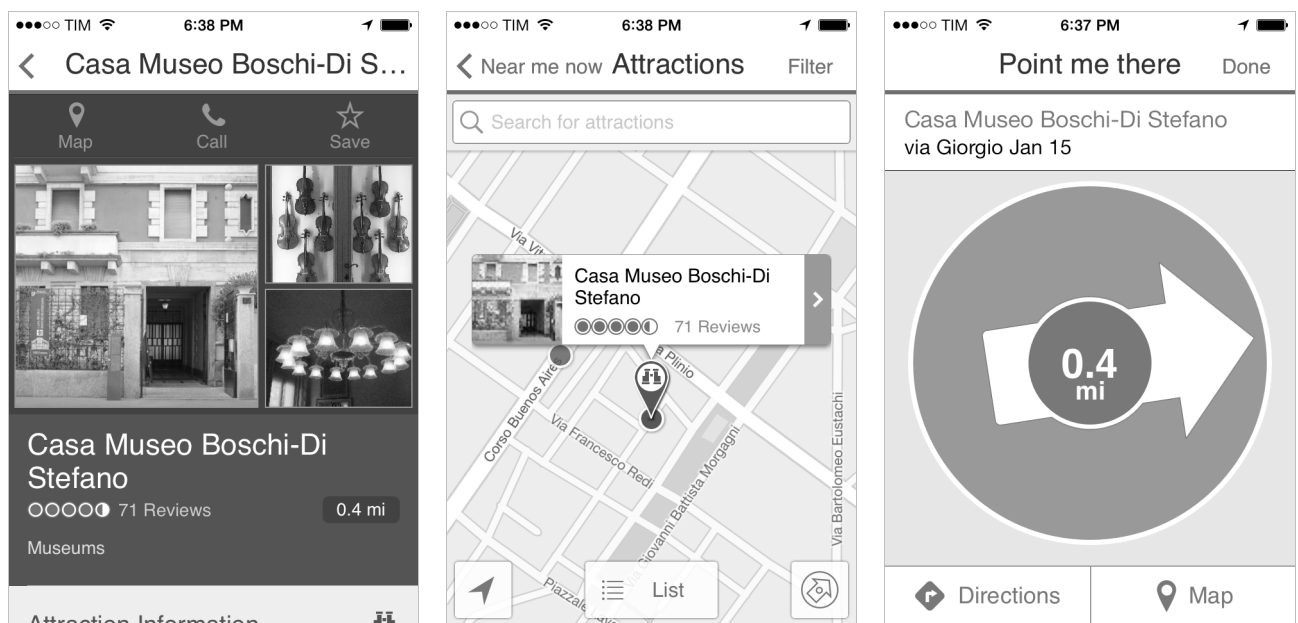
Local applications vs. global platforms

The author's personal comments include a comparison between the destinations' mobile applications currently available and similar applications released for the same destinations by benchmark global platforms like TripAdvisor, Foursquare, TripWolf or Google.

1. **Basic usability.** The companies' sizes, and widespread diffusion, grant global platforms resources allowing them to be fully cross-platform and cross-device. This advantage of TripAdvisor, Foursquare, TripWolf or Google over local applications is indisputable, and it cannot be easily overcome. As for proprietary apps, another advantage that global platforms enjoy, even more dangerous, is the customers' habit. An average tourist who has already downloaded and installed apps from TripAdvisor, Foursquare, TripWolf or Google is much less likely to download and install local apps, too. Convincing this tourist to add and use a local app is, independently from the quality of the content, a costly business.
2. **Destination identity.** Benchmark global platforms care about selling, not about the place where purchases are performed. So the destinations' brands and identities tend to become background noise, and this is the main reason why local applications should be endorsed.
3. **Personalization by market segments.** Though most global platforms provide only basic personalization by market segments, its navigation is often very effective (see Picture 2). Such personalization looks more structured in Foursquare. In the Google world it is even more structured, but less easily

navigable.

4. **Gamification.** This is Foursquare's *pièce de résistance*, though badge awarding is less popular elsewhere than in the States. Another interesting case can be found in the mobile edition of TripAdvisor: the compass, that gives LBS directions, is in fact a basic instance of visual gamification (Picture 3).



Picture 3. Screenshots showing basic visual gamification in TripAdvisor. Source: TripAdvisor on iPhone 4

5. **Destination managers' identity.** In global platforms, the DMOS' brands and identities, if any, tend to disappear completely. This is another good reason why local applications should be endorsed.
6. **Priority needs.** Here Google holds sway. The only feeble option left to destinations is delivering offline apps, the content of which may fulfil at least some basic information needs at no cost for the users.
7. **Accommodation.** TripAdvisor. Period.
8. **LBS.** Location-Based Services are Foursquare's main *pièce de résistance*. Following Foursquare, also Facebook and Google have introduced in their mobile interfaces a check-in button. TripAdvisor provides a proximity search function, called *Near me now*, as the first menu option, both in its web app and its proprietary app.
9. **Direct communication.** Potentially, this is a strong point of DMOS, though physical or phone communications are much harder to perform and more rarefied than social networking – and social networking is actively practiced by all the benchmark global platforms.
10. **Costs.** Only TripWolf, among the platforms mentioned here, asks for a fee to access its whole content. TripAdvisor provides eighty *City Guides* that are downloadable free and also work offline (among the destinations considered in

this research, however, only Aarhus and Seville currently enjoy a dedicated TripAdvisor *City Guide*). The other global applications – with the exception of TripWolf, once it has been downloaded – need an active network connection.

11. **Navigation.** Like for usability, the companies' sizes and widespread diffusion grant global platforms resources allowing them to develop simple and functional navigation interfaces. Differently from usability, though, this advantage is not indisputable, and can be overcome.

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¹ <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2013.pdf>

² <http://www.argophilia.com/news/mobile-browsing-travel/24859/>

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⁴ Dimitrios Buhalis, Luca Pistidda, “Wireless Applications in Destinations”, in Wolfram Höpken, Ulrike Gretzel, Rob Law (eds.), *Information and Communication Technologies in Tourism 2009*, pp. 161-171.

⁵ This work develops a research originally commissioned to the author in November 2012 by the City of Bergamo. The research was intended to identify role and feasibility of forecoming mobile tourism applications in the Bergamo area.

⁶ The choice of Ryan Air connections as a criterion was based, among other works, on “Ryanair SWOT analysis – Michael O’Leary’s maniacal focus on being the lowest cost producer”, published on February 6, 2013 at the CAPA - Centre for Aviation website <http://centreforaviation.com/> and, as far as leadership policies are concerned, on Uzoechi Nwagbara, “Homing in on Paradigm Shift: Ryanair Leadership in the Age of Expensive Air Travel,” in Kravis Leadership Institute, *Leadership Review*, Vol. 11, Spring 2011, pp. 204-214. For recent developments, see “Ryanair looks for far-flung profit” in *The Observer*, August 4, 2013.

⁷ See for instance Steven Pike, *Destination Marketing Organisations*, Elsevier (2004), pp. 133–135.

⁸ See <http://en.parisinfo.com/> (retrieved on October 23, 2013).

⁹ See Andrea Kostner (Vienna Tourist Board), “Do DMOS really need an app?”, a presentation held on January 26, 2012 at the Enter2012 congress organized by the Ifitt (International Federation for Information Technologies in Travel and Tourism), Helsingborg, January 24-27, 2012. A similar, updated presentation was held by Kostner on October 23, 2013 at the UNWTO Master Class “Improve your skills in developing, optimising and evaluating properly integrated e-marketing strategies”, Zadar, October 23-24, 2013.

¹⁰ See <https://itunes.apple.com/us/app/london-official-city-guide/id536603270?mt=8>, <https://play.google.com/store/apps/details?id=VisitLondon.Android&hl=en> and <https://www.facebook.com/pages/London-Partners/176178175766066> (all retrieved on October 23, 2013).

¹¹ For usability reasons, non adaptive and non responsive websites – which appear on the small monitors of smartphones without fitting to them, and are therefore practically unreadable – were excluded.

¹² Sometimes, for instance in the case of Lille, the main official city app does provide interesting and useful tourism content, too.

¹³ This distinction is based on the difference between two business models: whether the business sells the destination itself (either officially or unofficially), or sells its own products independently from destinations.

¹⁴ It is worthy to observe that serial apps are nearly always on sale, though at a reasonable price, while locally produced ones, both official and unofficial, are nearly always free.

¹⁵ Unofficial apps mentioned in the DMO official website, but not officially adopted or sponsored by the DMO, were considered unofficial.

¹⁶ The more radical and costly adaptive approach – under which the web app is designed differently, and is other than the desktop website – appeared to be more frequently adopted. Destinations do not look like appreciating much the responsive approach, under which the same html, css and javascript codes give the content different layouts, according to the size of the monitor.

¹⁷ The meta-model was proposed and has been applied since the late 1990s by the eTourism group from the Università di Trento <http://etourism.economia.unitn.it/>

¹⁸ Though several relevant papers are available in English from the webpage above – and a presentation can be downloaded from http://www.ec.tuwien.ac.at/files/etrends2007/Luisa_Mich.pdf – the meta-model is fully described and exemplified in Italian. See Luisa Mich, “Destination Marketing e Internet”, in Mariangela Franch (ed.), *Marketing delle destinazioni turistiche*, McGraw-Hill, Milano, 2010, pp. 277-324.

¹⁹ How deep a quality evaluation goes, depends on the client and the available resources. Under this respect, this work is most certainly provisional.

²⁰ Quality was defined by the ISO in 1994 as ISO 8402, or “the totality of characteristics of an entity that bear upon its ability to satisfy stated and implied needs.”

²¹ See note 18.

²² See above, under “The issues: content, protocols, and costs”

²³ They are the questions that refer to the Managers Content Compliance (“Does the content provided by the application meet the managers’ needs?”) and the Managers Services Compliance (“Do the services provided by the application meet the managers’ needs?”).

²⁴ The question on “ECommerce”, or “Does the application provide e-commerce functions?”

²⁵ See note above.

²⁶ See the comments in the final section of this work, under “Local applications vs. global platforms”.